

~~Martin GmbH für Umwelt-
und Energietechnik
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Patent claims

1. Process for creating and utilizing gas from waste materials, in which the waste materials are conveyed along a grate in a furnace and combustion air is applied, **characterized by the fact** that undergrate forced draft chambers at least in the longitudinal direction of the grate have combustion air applied to them in such a way that the waste materials in the charging area of the grate are ignited while oxygen is supplied at a superstoichiometric level, and by the fact that in the direction of slag removal the combustion is limited to a substoichiometric level, which is necessary for gasification of the combustible components.
2. Process as in Claim 1, **characterized by the fact** that after ignition of the waste materials oxygen at a substoichiometric level is mixed into the gasification air.
3. Process as in Claim 1 ~~or 2~~, **characterized by the fact** that the gasification temperature of the waste materials to be gasified is 600 to 850°C.
4. Process as in ~~one of the claims 1 to 3~~, **characterized by the fact** that the air ratio to achieve substoichiometric gasification is 0.4 to 0.8.

a 5. Process as in ~~one of the claims 1 to 4~~, **characterized by the fact** that in utilizing the resulting gases in a second furnace, which is connected to the first furnace either directly or via an exhaust gas flue, exclusively the combustible components which come from the first furnace are burned.

a 6. Process as in ~~one of the claims 1 to 5~~, **characterized by the fact** that combustion air in the form of ambient air is added to the exhaust gas coming from the first furnace.

a 7. Process as in ~~one of the claims 1 to 6~~, **characterized by the fact** that in the second furnace a higher-grade combustible gas is added to the volatile components in accordance with the calorific value of the latter.

8. Process as in claim 7, **characterized by the fact** that oxygen is mixed into the combustion air for the second furnace and/or into the higher-grade combustible gas.

a 9. Process as in ~~one of the claims 1 to 8~~, **characterized by the fact** that in the second furnace recirculated exhaust gas which is removed from the exhaust gas stream after cooling down in a heat recovery system is introduced to mix and burn out the gases.

a 10. Process as in ~~claims 5 to 9~~, **characterized by the fact** that the air ratio in the second furnace is 1.1 to 1.8.

a 11. Process as in ~~one of the claims 5 to 10~~, **characterized by the fact** that the combustion temperature in the second furnace is 950 to 1250°C.

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2 12. Device for carrying out the process according to ~~one of the claims 1 to 11~~, **characterized by the fact** that in the case of a furnace (1) comprising a fuel charging system (4, 5), a grate (6) with undergrate forced draft chambers which are subdivided in the longitudinal and possibly also in the transverse direction (8a to 8e), and a slag removal system (13), the undergrate forced draft chambers (8a to 8e) have lines (11a to 11e) for introducing oxygen.

13. Device as in claim 12, **characterized by the fact** that a second furnace (2) is connected with the first furnace (1) either directly or through an exhaust gas flue (12).

2 14. Device as in claim ~~12 or 13~~, **characterized by the fact** that the second furnace (2) has at least one line (14) for supplying combustion air.

2 15. Device as in ~~one of the claims 12 to 14~~, **characterized by the fact** that the second furnace (2) has at least one line (15) for introducing a higher-grade combustible gas.

16. Device as in claim 14, **characterized by the fact** that a line (16) for introducing oxygen is connected into the line (14) for the combustion air.

17. Device as in Claim 15, **characterized by the fact** that a line (17) for introducing oxygen is connected into the line (15) for a higher-grade combustible gas.

2 18. Device as in ~~one of the claims 12 to 17~~, **characterized by the fact** that the second furnace (2) has at least one line (18) for introducing recirculated waste gas.

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